PATENT
ATTY. DOCKET NO. VOY/030

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Hench et al.	Art Unit: 2665
Serial No.	:	09/710,487	Examiner: T. D. Tran
Filed	:	November 10, 2000	
For	:	METHOD AND APPARATUS FOR THE PREDICTION AND OPTIMIZATION IN IMPAIRED COMMUNICATION SYSTEM	

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Via Facsimile

TRANSMITTAL OF APPEAL BRIEF

1. Transmitted herewith, via facsimile, is the APPEAL BRIEF in this application, with respect to the Notice of Appeal filed on October 14, 2005.

2. STATUS OF APPLICANT

This application is on behalf of:

X Other than a Small Entity
___ Small Entity status of this application under 37 CFR 1.9 and 1.27 has been established by a verified statement previously submitted.
___ Enclosed is a verified statement to establish Small Entity status

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December 14, 2005
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Thomas W. Humphrey
Reg. No. 34,353

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The proceedings herein are for a patent application and the provisions of 37 CFR 1.136 apply. Complete (a) or (b) as applicable.

(a)___ Applicant petitions for an extension of time under 37 CFR 1.136 for the total number of months checked below:

Extension (months)		Fee for other than small entity	Fee for small entity
___	one month	$ 120.00	$ 60.00
___	two months	$ 450.00	$225.00
___	three months	$1020.00	$510.00
___	four months	$1590.00	$795.00
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Extension fee due with this request $ 0 .

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OR

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Respectfully submitted,

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PATENT
ATTY. DOCKET NO. VOY/030

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte Hench et al.

Appeal No. _____

Serial No.:	**09/710,487**
Filed:	**November 10, 2000**
Group Art Unit:	**2665**
Examiner:	**T. D. Tran**
Applicant:	**Hench et al.**
Title:	**METHOD AND APPARATUS FOR THE PREDICTION AND OPTIMIZATION IN IMPAIRED COMMUNICATION SYSTEM**

Cincinnati, Ohio 45202

December 14, 2005
Via Facsimile

APPEAL BRIEF

This brief is in furtherance of Applicant's Notice of Appeal filed October 14, 2005, appealing the decision of the Examiner dated June 14, 2005, finally rejecting claims 1, 2, 4, 6-20, 22, 24-31, 33 and 35-41. A copy of the claims appears in the Appendix to this brief.

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December 14, 2005
Thomas W. Humphrey — Date
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Real Party In Interest

The real party in interest in this appeal is Tokyo Electron Limited, a corporation of Japan having a place of business at TBS Broadcast Center, 3-6 Akasaka 5-Chome, Minato-Ku, Tokyo 107 JAPAN.

Related Appeals and Interferences

There are no such appeals or interferences.

Status of Claims

Claims 1, 2, 4, 6-20, 22, 24-31, 33 and 35-41, stand rejected under 35 USC 102(e), asserted to be anticipated by Gaikwad, U.S. Patent 6,317,495.

Claim 1 was originally filed with the application. Applicant's Amendment of April 23, 2002, added claims 2-41 and amended claim 1. Applicant's Amendment of July 29, 2003, amended claims 1-4, 13, 20-22 and 30-33 and cancelled claims 5, 23 and 34. Applicant's Amendment of December 17, 2003, did not amend the claims. Applicant's Amendment of May 10, 2004, amended claims 1, 13, 20 and 30 and cancelled claims 3, 21 and 32. A Request for Continued Examination was filed August 9, 2004. Applicant's Amendment of February 24, 2005, did not amend the claims.

Status of Amendments

There are no amendments pending.

Summary of Claimed Subject Matter

The claims presented in this application relate to prediction and optimization of a communications system having multiple channels, by predicting performance of plural channels using plural parameters to characterize each channel, and using a transfer function model that is "simulated using physical configuration information of the communications system".

There are substantial advantages to the claimed method and system, particularly, that they allow systematic improvement to a communication system without excessive field interaction with that system. Specifically, the use of transfer function simulations based on physical configuration, avoids the need for testing in the field, avoids waiting for downtime to do such testing, and avoids consuming communications resources to do such testing while the communication system is live and operative. The Examiner will appreciate that such simulation is an important improvement and enhancement over systems that rely upon actual measurement of transfer functions.

Grounds of Rejection

Whether the subject matter of any of claims 1, 2, 4, 6-20, 22, 24-31, 33 and 35-41 is anticipated by Gaikwad.

Argument

The Examiner's rejection relies upon the Gaikwad patent, so it will be briefly summarized here. Gaikwad describes methods for determining transmission characteristics for a communications channel, and then transmitting data on the channel. Gaikwad's method involves determining the channel's transfer function and determining its interference characteristics, also expressed as transfer functions. Gaikwad then creates a transmit spectrum (spectral density function) for the channel based upon the channel transfer function and interference characteristics. Gaikwad includes extensive disclosure on the optimization of the transmit spectrum, such as using orthogonal separation of the upstream and downstream traffic.

Gaikwad's disclosure includes a discussion of a simulation of the performance of his system, i.e., the effectiveness of the computed transmit spectra in increasing channel capacity. This simulation proceeds by simulating interference and channel behavior and tracking the channel performance based upon these simulations.

The critical point for the purposes of this appeal, Gaikwad's disclosure regarding how channel transfer functions are identified for use in the operation of his system – because the claims at issue recite the step of "creating at least one transfer function model of [] at least one of [a] plurality of channels ... using physical configuration information of the communications system".

The question is whether Gaikwad discloses any step of using physical configuration information to generate a transfer function model, and the answer is: clearly no. At col. 9, lines 30-33 of Gaikwad, it is stated that "[t]he transfer function and the interference

characteristics may be determined by measurement or they may be received from a remote or local analyzer or memory storage." Further elaborating, at col. 16, line 53 to col. 17 line 11, there is a discussion referencing Fig. 9, and the step 210 in that figure: "determine channel transfer function". The text at this location states that "[d]etermining the channel transfer function in step 210 of Fig. 9 may be done by directly measuring it. ... Alternately, the channel characteristics may be determined in advance of the communication and stored, for example in a database at the CO or in a memory on a DSL card."

The Examiner's rejection of the independent claims states that the Gaikwad Patent (6,317,495) discloses creating a transfer function model that is "simulated using physical configuration information of the communication system", as claimed. Applicant respectfully disagrees with the Examiner's rejection in this regard, as Gaikwad does not disclose such a capability.

The Examiner's rejection references Figure 15 of Gaikwad as showing a "simulated" transfer function model. Applicant respectfully submits the Examiner is incorrect. Figure 15 of Gaikwad referenced by the Examiner, includes a step 410 "determine channel transfer function", but there is no statement in the figure as to how that transfer function is determined. The accompanying text at col. 22, lines 52 also simply states that the method involves "determining a channel transfer function of the communications channel". There is no statement as to how that transfer function is determined.

Applicant submits that Gaikwad does not elaborate step 410, "determining a transfer function", for the reason that Figure 15 deals with an alternate embodiment of the Gaikwad disclosure (i.e., using frequency binning as state at col. 22, lines 34-35). Details are not

described because they are unchanged from the embodiments already presented. In those earlier embodiments, as noted, "[t]he transfer function and the interference characteristics may be determined by measurement or they may be received from a remote or local analyzer or memory storage."

Applicant submits that the methods Gaikwad describes for determining a transfer function involve measurement, either during a communication, or before the communication so that the transfer function may be obtained later. No other methods are referenced, and more specifically, simulation based on physical configuration information is not mentioned.

Indeed, at col. 19 lines 5-8, Gaikwad specifically states that "the channel transfer function may be determined at power-up of a transmission system, at regular intervals in time, or in response to temperature changes, or at other appropriate times." Each of these examples involves use of the transmission system to create a transfer function, i.e., measuring the transfer function from the system, at particular times when the communications system is powered up. This is not "simulat[ing] using physical configuration information of the communications system," as claimed.

The Examiner's remarks appended to the final action, cite col. 25, lines 55-65 for showing "simulation for a physical configuration." That section, however, does not disclose the use of a physical configuration to simulate a transfer function. Rather, as discussed above, this section of Gaikwad is directed to simulating performance of the overall system, not just a transfer function; and, there is no statement of the origin of the transfer functions that are used in the simulation. Applicant submits that transfer functions are either concocted to simulate typical problematic performance in a channel, or are derived from actual measurements on

actual channels, as Gaikwad discloses elsewhere. There is no suggestion that the physical configuration of a system be used to generate the simulation of a transfer function.

The Examiner's remarks also argue that Gaikwad discloses determining a transfer function, which is correct, but not germane. The question is not whether Gaikwad determines a transfer function, but how the transfer function is determined. As stated, Gaikwad only discloses creating transfer functions from measurements, not using physical configurations.

In light of the foregoing, Applicants submits that the Examiner's rejection of independent claim 1 is in error and should be withdrawn.

The Examiner's rejections of independent claims 13, 20 and 30, on pages 3-4 of the Office Action, do not supply any additional bases for concluding that Gaikwad discloses simulating transfer functions using a physical configuration, as recited in each of those claims. Applicant therefore submits that each of claims 13, 20 and 30 are patentable over Gaikwad for the reasons already recited, and that their rejection should be withdrawn.

As this foregoing explains the allowability of each of the independent claims, Applicant submits that all claims are allowable, and requests early transmission of a Notice of Allowability. Applicant disagrees with the Examiner's rejection of the dependent claims and the reasons therefor but for the sake of brevity those issues will not be addressed here.

Accordingly, Applicant submits that the Examiner's rejection is in error and a reversal of the rejection and allowance of the claims is therefore requested.

Respectfully submitted,
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Claim Appendix

1. (Previously Presented) A method for the prediction and optimization of a communications system comprising:

inputting data from a plurality of channels of the communications system;

predicting a performance of at least one of the plurality of channels using a plurality of parameters to characterize the performance of the channel;

creating at least one transfer function model of the at least one of the plurality of channels, wherein the at least one transfer function model is simulated using physical configuration information of the communications system; and

optimizing the parameters of at least one of the plurality of channels in order to improve a bit rate of the at least one of the plurality of channels in the communications system.

2. (Previously Presented) The method claim 1 wherein predicting the performance of the at least one of the plurality of channels comprises:

inputting data from at least one channel of the communications system into a prediction module;

determining an impairment on the at least one channel;

characterizing the at least one channel using the at least one transfer function model and the impairment.

3. (Cancelled) The method of claim 2 wherein the at least one transfer function model is simulated using physical configuration information of the communications system.

4. (Previously Presented) The method of claim 2 wherein the at least one transfer function model is simulated using a spectrum management system.

5. (Cancelled) The method of claim 2 wherein the at least one transfer function model is created by measuring the transfer function from the communications system

6. (Previously Presented) The method of claim 2 wherein the impairment is selected from the group consisting of: a cross-talk impairment, an AM radio interference, a temperature impairment, and any combination thereof.

7. (Previously Presented) The method of claim 1 wherein optimizing the parameters comprises:

a) choosing a first parameter for the channel;

b) choosing a second parameter for the channel;

c) determining an optimization criteria for the channel based upon the first parameter and the second parameter;

d) repeating a) - c) until the optimization criteria is optimized for the communications system.

8. (Previously Presented) The method of claim 1 wherein the communications system is a wireline communications system

9. (Previously Presented) The method of claim 1 wherein the communications system is a wireless communications system

10. (Previously Presented) The method of claim 1 wherein the communications system is an optical communications system

11. (Previously Presented) The method of claim 1 wherein the communications system is a cable communications system.

12. (Previously Presented) The method of claim 1 wherein the communications system is a DSL communications system

13. (Previously Presented) A system for the prediction and optimization of a communications system comprising:

a prediction module, wherein the prediction module predicts the performance of at least one channel in the communications system by providing a characterization of at least one parameter that describes the channel; and wherein the prediction module creates at least one transfer function model of the at least one channel such that the at least one transfer function model is

simulated using physical configuration information of the communications system; and

an optimization module, wherein the optimization module fords the optimum characterization for the channel based on at least one design criteria.

14. (Previously Presented) The system of claim 13 wherein the design criteria are selected from the group consisting of: a cost of deployment, a signal to noise ratio, a total revenue, a bit rate, and any combination thereof.

15. (Previously Presented) The system of claim 13 wherein the communications system is a wireline communications system

16. (Previously Presented) The system of claim 13 wherein the communications system is a wireless communications system.

17. (Previously Presented) The system of claim 13 wherein the communications system is an optical communications system.

18. (Previously Presented) The system of claim 13 wherein the communications system is a cable communications system.

19. (Previously Presented) The system of claim 13 wherein the communications system is a DSL communications system

20. (Previously Presented) A method for the prediction of the performance of a communications system comprising:

inputting data from at least one channel of the communications system into a prediction module;

creating at least one transfer function model of the at least one channel, wherein the at least one transfer function model is simulated using physical configuration information of communications system;

determining an impairment on the at least one channel;

characterizing the at least one channel using the at least one transfer function model and the impairment.

21. (Cancelled) The method of claim 20 wherein the at least one transfer function model is simulated using physical configuration information of the communications system

22. (Previously Presented) The method of claim 20 wherein the at least one transfer function model is simulated using a spectrum management system

23. (Cancelled) The method of claim 20 wherein the at least one transfer function model is created by measuring the transfer function from the communications system

24. (Previously Presented) The method of claim 20 wherein the impairment is selected from the group consisting of: a cross-talk impairment, an AM radio interference, a temperature impairment, and any combination thereof.

25. (Previously Presented) The method of claim 20 wherein the communications system is a wireline communications system.

26. (Previously Presented) The method of claim 20 wherein the communications system is a wireless communications system

27. (Previously Presented) The method of claim 20 wherein the communications system is an optical communications system.

28. (Previously Presented) The method of claim 20 wherein the communications system is a cable communications system.

29. (Previously Presented) The method of claim 20 wherein the communications system is a DSL communications system.

30. (Previously Presented) A method for the prediction and optimization of a communications system comprising:

inputting data from at least one channel of the communications system;

creating at least one transfer function model of the at least one channel, wherein the at least one transfer function model is simulated using physical configuration information of the communication system;

predicting a performance of at least one channel using at least one parameter to characterize the performance of the channel; and

optimizing the at least one parameter of at least one channel in order to improve a bit rate of the at least one of the channels in the communications system

31. (Previously Presented) The method claim 30 wherein predicting the performance of the at least one of the channels comprises:

inputting data from at least one channel of the communications system into a prediction module;

determining an impairment on the at least one channel;

characterizing the at least one channel using the at least one transfer function model and the impairment.

32. (Cancelled) The method of claim 31 wherein the at least one transfer function model is simulated using physical configuration information of the communications system.

33. (Previously Presented) The method of claim 31 wherein the at least one transfer function model is simulated using a spectrum management system.

34. (Cancelled) The method of claim 31 wherein the at least one transfer function model is created by measuring the transfer function from the communications system.

35. (Previously Presented) The method of claim 31 wherein the impairment is selected from the group consisting of: a cross-talk impairment, an AM radio interference, a temperature impairment, and any combination thereof.

36. (Previously Presented) The method of claim 30 wherein optimizing the at least one parameter comprises:

a) choosing a first parameter for the channel;

b) choosing a second parameter for the channel;

c) determining an optimization criteria for the channel based upon the first parameter and the second parameter;

d) repeating a) - c) until the optimization criteria is optimized for the communications system

37. (Previously Presented) The method of claim 30 wherein the communications system is a wireline communications system.

38. (Previously Presented) The method of claim 30 wherein the communications system is a wireless communications system

39. (Previously Presented) The method of claim 30 wherein the communications system is an optical communications system.

40. (Previously Presented) The method of claim 30 wherein the communications system is a cable communications system.

41. (Previously Presented) The method of claim 30 wherein the communications system is a DSL communications system.

Evidence Appendix

None.

Related Proceedings Appendix

None.

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